

NEUTRAL MESONS AND DIRECT PHOTONS IN PP AND Pb-Pb COLLISIONS AT MID-RAPIDITY WITH ALICE AT LHC ENERGIES

Lucia Leardini¹

¹ on behalf of the ALICE Collaboration

Neutral mesons, such as π^0 and η , are probes for the study of the energy loss of partons traversing the hot and dense medium, the Quark-Gluon Plasma, that is formed in heavy-ion collisions. Photons are created during the entire space-time evolution after the collisions and leave the medium unaffected: they are ideal probes to study collective expansion and temperature of the system, but have large background from decay photons, thus requiring an accurate measurement to determine their contribution. ALICE measures π^0 and η mesons via the two-gamma decay channel. The photon detection can either be direct, using the electromagnetic calorimeters EMCal and PHOS, or by reconstructing the electron-positron pairs from photon conversions in the detector material (photon conversion method, PCM). With the PCM, photons are reconstructed using the ALICE Inner Tracking System (ITS) and the Time Projection Chamber (TPC). This method has full azimuthal coverage, which compensates for the small conversion probability. It provides a precise measurement at low transverse momentum. The calorimeters have reduced acceptance but trigger capabilities and provide the high p_T measurement, where they also have good energy resolution. The errors from these measurements are independent thus their comparison is a good cross check and their combination gives a more precise result.

In this presentation, the neutral mesons and direct photons results in pp and Pb-Pb collisions at LHC energies over a large range of transverse momentum will be shown, alongside with the most recent theoretical predictions.